

Metadata Acquisition via Interactive Games

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Metadata play an important role in today's web-based world. Every time we search for web pages, pictures or videos, we get results that were found by using metadata. Its collection and creation is a challenging and complex job, which can be facilitated via *the power of human computation* [1].

We devised a game for automatic acquisition of metadata for photos. The basis of our project is the memory game PEXESO, which was reinvented to be useful for image annotation (Figure 1). We extended the game with hint for players in such a way that *players can write notes* (Figure 1, B) to *unveiled images* (Figure 1, C). The next step was to persuade the players to use the offered opportunity with increasing the size of the table up from 8x8 (Figure 1, A). Players need not memorize the exact location of pictures since by knowing their rough positions they can find the pairs via tags they input, which are shown as tooltips.

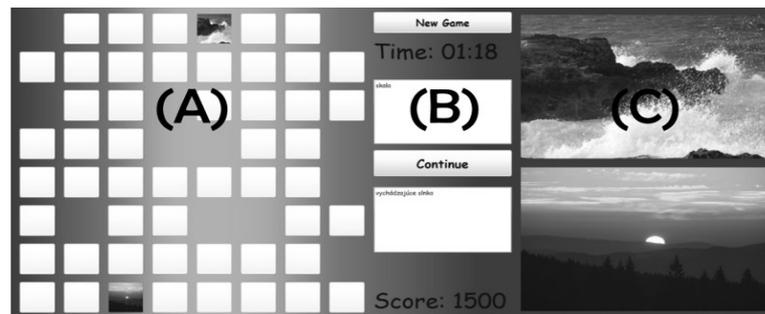


Figure 1. PexAce interface: main board (A), block with controls (B) and reversed photos (C).

We measure only time spent for searching for suitable cards, i.e. when 2 cards are inverted, players can properly label them as that stops time measurement. Once the player clicks 'Continue' or presses 'Enter', time starts to run again and the player can continue to search cards. As a cheating precaution, tooltips do not appear above cards

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during annotation as this could allow smarter players to quickly reverse two cards and stop time measurement with tags shown.

To get reasonable annotation coverage for evaluation as soon as possible, we narrow down the number of photos used to 600 and in each new game select pictures from this narrowed range. Once we collect enough tags for an image, we put it on a blacklist and select only photos that are not yet sufficiently annotated in new games. After getting basic annotations, we also select photos with similar content to make the game more difficult and *produce more precise tags for given photos*.

With our prototype of the game PexAce we gained 56 registered users, and some users that played our game as guests. We know use the first 600 photos from our dataset, which have so far been annotated with 1,599 annotations, corresponding to 2,605 words, what means that we created in average 2.67 annotations and 4.43 words for one photo.

The quality of labels is very promising, because only few of them contain misspellings or are written in other languages. Even these tags are not lost as we fix them via the Google Translate and WordNet services.

We accept and save user input as tags if 3 different players agree on the same tag for a photo. With this method we eliminated the problem of multiple words given by the same user to the same photo, because these words are counted only once. Guests are treated as a single user.

Today's results and research suggest that we cannot underestimate the potential of Games With A Purpose [2], which *can utilize lots of time wasted by playing normal games* for benefit in many areas that can be supported by GWAPs [3].

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References

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